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INSTITUTES OF GEOLOGICAL SCIENCES IN THE USSR

By E. Ruhle

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INSTITUTES OF GEOLOGICAL SCIENCES IN THE USSR

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The projects and research institutes of geological sciences in the Soviet Union represent a very comprehensive subject. They include the most varied theoretical and applied problems from all fields of geological sciences together with problems of method, progress and technical development, and investment in instruments and equipment.

Geological research and prospecting is connected to different branches of the national economy; for this reason the majority of the tasks and most financial resources are at the disposal of scientific institutes subordinate to departments responsible for and directing different sectors of the economy. In the Soviet Union the principal institutes of geological science come within the range of interest of a number of departments.

The Department of Geology and for the Preservation of Mining Resources, a separate government department, handles most problems connected with assuring a raw material base for various sectors of the economy. The scientific members of the department are six institutes; they are:

1. The All-Union Geological-Research Institute in Leningrad -- VSEGEI
2. The All-Union Hydrogeological and Engineering-Geological Institute in Moscow -- VSEGINGEO
3. The All-Union Scientific-Research Institute of Geophysics in Moscow -- VNIIG
4. The All-Union Institute of Mineral Wealth in Moscow -- VIMS
5. The All-Union Institute of Prospecting Methods and Techniques in Moscow -- VITR
6. The Institute of Arctic Geology in Moscow.

The All-Union Scientific-Research Institute of Geological Prospecting in Leningrad (VNIGRI) and the All-Union Scientific-Research Petroleum Institute in Moscow (VNINI) are subordinate to the Department of the Petroleum Industry.

The Moscow Institute of Non-Ferrous Metals and Gold imeni M. I. Kalinina is subordinate to the Non-Ferrous Metals Industry Department.

The Coal Industry Department oversees a group of institutes doing research in the field of geology, technology and coal processing. The

remaining departments of this sector of the economy, such as the Ferrous Metals Department, the Chemistry Department, and the Building Department also have geological centers in the practical specialization field.

A separate, large group of institutes of geological sciences is found in the Academy of Sciences. Its largest scientific centers are situated in Moscow; they are:

1. The Institute of Geology
2. The Institute of Ore Deposit Geology, Petrography, Mineralogy and Geochemistry
3. The Institute of Earth Physics.

Apart from the largest institutes mentioned within the Department of Geological-Geographic Sciences of the Academy, a few additional institutes with a narrower range of activities are located in Moscow. They are: the Institute of Mineralogy, Geochemistry, and Crystallography of Rare Elements; the Institute of Oceanography, the Institute of Permafrost Studies imeni V. A. Obrucheva, and laboratories on pre-Cambrian, coal geology, volcanology, hydrogeological problems imeni F. P. Savarenskiyego, aeromethods, and a series of others.

Outside Moscow, regional branches of the Academy of Sciences are situated in the majority of union-republic capitals; in these, the geological sciences are represented by separate departments. The more important departments are in the Ukrainian SSR, Byelorussian SSR, Georgian SSR, Azerbaydzhan SSR, Armenian SSR, Kazakh SSR, Uzbek SSR, the Petropavlovsk Institute, the Sverdlovsk Institute, and others.

My stay during two visits to the USSR was too brief, so I could not gather complete material to give an up-to-date representation of this widely ranging subject. Nevertheless, thanks to the co-operation of a number of people, the information gathered presents a general view of the problems of geological institutes in the Soviet Union.

Institutes of the Department of Geology

The All-Union Geological Research Institute (VSEGEI).

VSEGEI is the principal scientific center of the Department of Geology and Preservation of Mining Resources in the broad field of prospecting and geological research for deposits of mining resources in the USSR.

It is the oldest geological institute in the Soviet Union; its activity began in 1882 as the Geological Committee. It has achieved great successes in revealing the geological structure of the USSR. The most prominent geologists and miners worked in the scientific teams of the institute for many years; to a great extent it is the universal scientific base for the development of geological sciences during the last decades. Several organizational changes, particularly between 1919-1939, transformed the structure and role of the institute to the dimensions of a large center for research on the geological structure and prospecting for deposits of the USSR. Its role and tasks may be formulated in the following paragraphs.

1. The projects of the Institute form wide bases for research, prospecting, and identification of mineral resources deposits, and for hydrogeological and geological-engineering problems of individual geological services in the Soviet Union.

2. The Institute is responsible for the systematic development and modernization of all research methods and geological projects and their standardization in various institutions. In connection with this, the Institute publishes method outlines, stratigraphic diagrams, dictionaries, and other aids. An all-union stratigraphic commission is active in the Institute; it establishes stratigraphic divisions of different regions and systems.

3. The Institute makes geological photographs and makes and publishes geological and mineral resource maps with different scales; these are one of the principal bases for deposit prospecting. The principal editorial committee for geological and raw material maps published in the Soviet Union is located in the Institute.

Through its institutions and laboratories, the Institute gives scientific direction to and co-ordinates most research carried out by field branches of the Department of Geology and Preservation of Deposits.

To fulfill the above-mentioned tasks, the institute is carrying on extensive paleontological, petrographical, mineralogical, geochemical, and geophysical research. It works out prognoses for the location of deposits and gives concepts of their genesis. This results in syntheses and monographs on many problems and scientific questions. One of the most important aspects of research is resistivity drilling, which is fast advancing our knowledge of deep structures.

The organizational structure of the Institute consists of three groups; they are discussed below.

I. Regional geology includes the problems of general geological studies in individual regions or provinces of the Soviet Union. The regions are the following: 1) the Western region, including all the European part of the Union, 2) the Urals, 3) Kazakhstan, 4) Central Asia, 5) Western Siberia, 6) Eastern Siberia, 7) the Far East.

Regional groups work with the assistance of so-called expeditions, which have specialists from all the required departments and methods of research on their staff. Geologist-cartographers, stratigraphy specialists, geophysicists, petrographers, and paleontologists take part in them. In connection with the increasingly wide use of aerial photographs, geodesists, topographers, and geologists specializing in the interpretation of these photographs are taking part in the expeditions.

Numerous geophysical and drilling teams belonging to different services and field departments co-operate in the research of the expeditions.

II. Basic research is carried out in the following departments: geophysics, stratigraphy, paleontology, petrography, mineralogy and geochemistry, quarternary geology, geomorphology, methods of geological deposit photography and inspection maps, methodological research, and projects.

III. The problems of mineral resource deposits are represented by the departments concerned with ore deposits and the origin of metals,

deposits of nonferrous resources, deposits of energy resources, and hydrology.

The individual departments are divided into sections and workshops. For example, the stratigraphical-paleontological department works in two sections, micropaleontological and paleontological. The section for spectral analysis, structural X-ray studies, thermal studies, and absolute age studies operates in the department of mineralogy and geochemistry.

To realize this extensive program of research, the institute has a large, highly qualified staff with a high record of achievements. In 1957 the number of scientific and scientific-technical workers exceed 1,000 persons. Of these, 642 are workers with a higher education; they include five academicians, 47 doctoral graduates, and 227 candidates of science, and a total of 276 senior scientific workers. This is approximately 27 % of all the workers. With such a staff on hand, the institute has become one of the leading factors in the development of geological sciences in the Soviet Union.

The All-Union Hydrogeological, Geological-Engineering Institute in Moscow (VSEGINGEO)

This institute was formed in 1946 as a result of the reorganization of scientific institutes of the Geological Service of the Soviet Union. It is composed of two separate sections, the hydrogeological and the geological engineering sections.

In the field of hydrogeology, the Institute works on the following problems:

1. Horizontal and vertical distribution of underground water zones,
2. Formation of the chemical composition of underground waters,
3. Mineralization regions and the regularity of their distribution,
4. Role of underground waters in damaging deposits of different mining resources.
5. Mobility of underground waters under various natural conditions and under conditions altered by man.

A large part of the Institute's activity consists of scientific and methodological direction of hydrogeological centers of the Department of Geology and Preservation of Mining Resources, and of other centers. It consists of systematic consultations, studying instructions and methods data for research, establishing water prognoses and water-balances under various geological conditions.

To date, the Institute has worked out research methods for the majority of types of hydrogeological work; among others, for hydrogeological map drawing and map studying, for various experimental and special laboratory projects, and methods to evaluate the possibilities of pumping out water from mining deposits. Methods have been established to evaluate the exploitation resources of underground waters and to put them into practice. In the past few years a great deal of attention has been drawn to hydrochemical methods of prospecting for mining deposits. Research using geophysical, geobotanical, and aerial methods has been widely applied in hydrogeological practice.

The Institute does its field work with the assistance of hydrogeological stations and landslide stations whose range of studies includes the following: 1) systems and resources of water with the aim of supplying water; 2) hydrogeological conditions for melioration purposes; 3) hydrogeological conditions for hydrotechnical construction; 4) hydrogeological conditions in urban centers.

The studies of landslides are a separate problem in the activities of the stations. The stations are located in the twelve most important regions of the European part of the USSR. Five stations are active in Kazakhstan with the main purpose of melioration. Apart from these, six stations are working in Central Asia and Siberia.

Drillings are being carried out under the direction and scientific control of the Institute to supply agriculture with water. For example, only between 1951 and 1955, 385 openings were made in the areas of Bukhara and Kirgiziya; 597 wells were drilled in Kazakhstan and Povolzh, and in the Moscow-Riyazanskaya region, 600 wells were drilled.

Hydrogeological photographs were taken directly by the Institute; under its control are regions which are important from the economic point of view. During the past decade steppe and desert areas of Central Asia were mainly photographed; here, water is a decisive factor in improvement projects. Here also, it made the greatest sense to take a regional photograph on a scale of 1:500,000. 10% of this wide area was covered in this research. A second type of geological and hydrogeological photograph is being taken in selected areas of Kazakhstan, Kuban', Maykop, Emba and Polesie on a scale of 1:200,000. The third type are photographs of the regions with big hydroelectric power installations on the central lower Volga and the lower Dniepr. They are taken to make maps with scales of 1:50,000 and 1:100,000. A separate type of map illustrates the structure of artesian wells in the regions of Moscow, Odessa, Kersoniya, Northern C Caucasus, and the basins of the Irtysh and Amu-Dariya rivers.

As a result of these extensive hydrogeological projects, the synthesis of many problems was carried out and numerous hydrogeological maps of considerable areas were drawn up.

In the field of engineering geology, the Institute studies together with local institutes: 1) areas of large government construction, mainly for hydroelectric power installations; 2) geological-engineering conditions for large deposits; ore deposits on the Kursk magnetic anomaly, in Kremienchug, Kushmerenskiy deposits of brown coal, and a number of newly discovered deposits in Kazakhstan, Siberia, and the Far East.

A great deal of attention has been given to regional geological-engineering research; namely, to the geological-engineering regional division of the southern coast of the Crimea to establish conditions for constructing sanatoria and for introducing improvements to the loess of Turkmeniya and the basic geological-engineering elements of Tadzhikstan to the physico-mechanical characteristics of loess formations of the Tadzhikstanskaya depression, and to methods of classifying them according to permeability.

The last three departments are connected with the construction of the Kara-Kum-Turkmen canal, and to irrigation methods in desert and steppe regions.

The laboratories of the Institute in the field of engineering geology are developing laboratory and field methods for the identification of mineral content, physical and mechanical conditions, type of structure, and rock-texture, using different research methods.

The development of the Institute is illustrated by the number of projects executed; some of them are published, and on the other hand, some are entered into the archives as documentary material.

Period	1947	1952	1957
Publication			
Number of projects	14	18	58
Number of printer's pages	26	33	138
Archives			
Number of projects	23	44	75

From the table, it appears that during one decade the publications of the Institute have increased five times, with hardly a two-fold increase in the material entered into the archives. This is a very good sign, because publications reflect the scientific activities of the Institute, in other words, its lasting and widely-known achievements.

The figures concerning the staff of the Institute, given on the enclosed table, are interesting:

Period	1947	1952	1957
Total number of workers this includes:	121	159	320
senior scientific workers	33	32	44
junior scientific workers	66	98	151
administrative workers	22	29	25

It is apparent from the analysis of the figures that the staff of the institute increased two-fold during the last five years; the number of scientific workers increased, while the number of administrative workers decreased. The relatively high percentage of independent scientific workers should be noted (20% in 1952, and 14% in 1957). This guarantees a high scientific level of the research carried out.

The All-Union Scientific Research Institute of Geophysics in Moscow (VNIIG)

Geophysical research in the Soviet Union is carried out by a number of institutions. One of the most important is the All-Union Scientific-Research Institute of Geophysical Research Methods (VNIIG-Geophysics) of the Petroleum Industry Department; it was formed in 1944. Another is the All-Union Scientific-Research Institute of Geophysics (VNIIG), subordinate to the Department of Geology and Preservation of Mineral Resources, it was formed a year later. Apart from these institutes, a wide range of geophysical subjects are handled by the All-Union Institute of Research Methods and Techniques (VITR), organized in 1954 by the Institute of Earth Physics of the Academy of Sciences.

Important scientific projects in the field of geophysical methods and their applications are conducted in the departments of the All-Union Geological-Research Institute in Leningrad, by geological prospecting petroleum institutes in Moscow, Ufa, and Baku, in the Institute of Arctic Geology, in the Geological Institute of the Ural Branch of the Academy of Sciences, in the Geophysical Institute of the Georgian Academy of Sciences, and in others.

The work of the All-Union Scientific-Research Institute of Geophysics includes experimental problems and research using various geophysical methods for prospecting and evaluation of mining deposits. These works concern: a) geophysical field methods; b) geophysical research in drill openings, industrial geophysics; c) research on the introduction of geophysical methods to evaluate and exploit ore deposits. These are the beginnings of ore geophysics.

An especially great achievement is the development of complex geological-geophysical methods for the study of individual regions and industrial areas. It produced many positive results. A classical example of such rational complex geological-prospecting projects is the studies of the Kursk magnetic anomaly.

A method of work has been established which foresees the rational execution of magnetic, gravimetric (with gravimeters and variometers), and seismic operations. During the first stage, aeromagnetic photographs on a scale of 1:200,000 are most often used; gradually, more detailed surface photographs are made by various methods.

Geophysicists of the Institute have gathered much information in the field of seismology while prospecting and studying deep structures. Studies of structures with a depth of approximately 30-40 meters and the revealing of structures up to five kilometers in depth are undertaken using the reflection method. The majority of deposit discoveries during the past few years are due to this method. The reflection method is applied mostly to studies of the surface of a buried crystalline foundation and of its geologic structure. Deep seismic probes assist in studying the structure of the earth's crust to a depth of 40 kilometers. Thanks to this method, it was possible to mark off and trace several dividing lines in the earth's shallow crust. The results of deep seismic probings promote the clarification of the structure of regional gravitational anomalies and the establishment of principles for the connection of gravimetric and magnetic fields with the structure characteristics of sedimentary series.

As regards the application of geoelectrical methods to research and prospecting, experimental projects are aiming at discovering and contouring deposits of nonferrous or rare metals and at solving hydrogeological problems. Among the various methods one should note a series of modifications of the resistivity method, which was successfully used to depths of 2,500 meters. However, to contour ore deposits with electrical conductivity discovered by mining and drilling works, the "charged body" method is used. The next method, which has also been perfected, is the tellurous currents method; it is applied in studies of deep structures of large territories.

Radiometry is considered very interesting because of prospecting for deposits of radioactive elements. Prospecting, evaluation, laboratory, and mining methods were developed on the basis of the Institute's own and other institutes' experiences.

The Institute has achieved a great deal in developing the method and equipment for core sampling as a contemporary means of documenting geological profiles. Simultaneously with the development of electrical core sampling, work on other types of core sampling and operations in drilling openings was being carried out. Attention was given to methods of temperature measurement. The wide application of core sampling methods in the petroleum and coal industries helped in reducing to a minimum the gathering of core. Of course, resistivity drillings, prospecting drillings, and evaluation drillings are an exception where core analysis is still practiced. Attempts are being made to evaluate the per cent content of ore in drilling with the help of core sampling; this would limit the gathering of core in this branch of prospecting as well.

In connection with such a rapid development of geophysical research between 1946-1957, and particularly after 1951, the problem arose of training the necessary staff; its numbers were increased by hundreds of specialists with a higher and secondary education.

A second problem was the question of supplying the appropriate equipment; this lately has been manufactured by a separate enterprise subordinate to the Petroleum Industry Department, which co-ordinates several manufacturers.

The All-Union Institute of Mineral Resources in Moscow (VIMS)

The results obtained in industrializing the USSR were made possible by the co-operation of the All-Union Institute of Mineral Resources, organized on the principles laid down by the Petrographic Institute (LITOGEA) and founded in 1910 by V. V. Arshinova. The great pressure of work in the field of ore mining and metallurgy after 1930 required the foundation of individual institutes of a technological type. It was possible to realize this because of an appropriate scientific basis; this is the All-Union Institute of Mineral Resources. At present, these principles and methods of work are used by all institutes and scientific centers studying the problems of ore deposit prospects; there are: the All-Union Geological-Research Institute, the Kazakh Institute of Mineral Resources, the Kirgiskiy Institute of Mineral Resources, and others, apart from the All-Union Institute of Mineral Resources.

The work of the All-Union Institute of Mineral Resources is mainly conderned with metal ore (problems of caustic biolites; petroleum and coal are studies in other institutes). The Institute has the task of using the deposits rationally and of evaluating the mineral properties and their interdependence; precisely, of studying the processes of a selective division and of using all the valuable elements. The following complex of research is being carried out to fulfill these tasks:

1. Designation of the physical, physico-chemical, and physio-mechanical properties and types of minerals, ores, and rocks; of specific

and volumetric weights; of hardness and granulometric composition;

2. Designation of the chemical composition -- demostrating the principal and accessory minerals by various methods of qualitative and quantitative analysis;

3. Designation of the mineral-petrographic composition to establish chemico-technological properties;

4. Study of the technological properties and types of mineral resources in order to study the industrial plan for their complex use;

5. Economic research and exploitation projects which are the summation of the results of geological-mineralogical and technological research, and the establishment of necessary conditions for the exploitation of deposits discovered.

It is apparent from the above program of research that complex methods of work are being applied at present in the Institute, characterized by an every wider introduction of various means and methods of research. Very penetrating studies are being made of the material of mining resources (concerning research on atom structure) by the method of electronography a nd by means of the method of mass spectrography to separate isotope properties. The Institute faces the task of finding new types of mineral resources and their new sources, together with a wide application of new methods of research in connection with economic and exploitation problems.

The All-Union Institute of Mineral Resources initiates the concentration of scientific-research and experimental methods of work in order to put into practice new methods and the methods already in use for the study of mineral resources in scientific institutes, as well as in various industrial organizations.

The All-Union Scientific-Research Institute of Prospecting Methods and Techniques in Leningrad (VITR)

The All-Union Scientific-Research Institute of Prospecting Methods and Techniques was organized with the aim of perfecting methods of prospecting, backed up by the perfection of instruments, equipment, and machines.

In the field of methods and geophysical instruments, geophysical equipment was perfected with the help of outstanding constructors and specialists in atomic physics, automation, and telemechanics. Particular attention was given to regional geophysics and to methods of aerogeophysics. A group of workers from the Institute, with the co-operation of the All-Union Scientific-Research Institute of Geophysical Prospecting Methods, constructed the SN3 gravimeter, which later underwent a series of reconstructions. Its model is known by the symbol GA 3M.

While constructing gravimeters for surface photographs, work was under way to construct benthonic gravimeters (for work on the bottom of water basins). This apparatus permitted geophysical science in the Soviet Union to stop importing this type of instrument from abroad.

At the same time, the methods and techniques of taking gravimetric photographs on shore and on the bottom of bodies of water was being developed

and perfected. One of the most important achievements in the field of magnetic instruments was the construction of the aeromagnetometer AEM 49 under the direction of G. S. Smirnov. It presented much greater possibilities for prospecting not only for magnetic deposits of iron ore, for which aerial usage of magnetic photographing was mainly applied, but also for regional prospecting in areas with a large cover of sedimentary rocks.

Soviet seismology, widely applied in petroleum prospecting, was lately equipped with these apparatuses: 60-channel PSS-60-55, 60-channel SS-30/60-36, and the 24-channel (24-channel portable apparatus for inaccessible regions) SS-24P. A series of instruments was modifield in the field of geoelectricity. In the field of radiometry, stations ASG-38 and SG-14.

One of the departments of the Institute deals with the interpretation of geophysical measurements.

Another part of the Institute's research is in drilling problems; these have a great influence on prospecting. Systematic research and observations are carried out at specially organized experimental station, as well as during drilling series. The Institute's research mainly concerns drilling equipment for medium depths. An independent institute exists under the Pettoleum Industry Department which deals with the technology and equipment of petroleum drilling reaching 5,000 meters in depth.

Starting in 1950, technical experiments were carried out in the Institute, particularly on drillings of ore deposits, and in geological engineering research with the use of various types of vibration machinery. They stood the test in shallow drillings, in which they gave a good amount of core as well as five to six times greater speed. Further experiments to perfect all types of vibration machinery for deeper drilling are in process.

Apart from this, attempts are being made to utilize ultrasonics in drilling, but they are not beyond laboratory stage. So-called electrohydraulic processes are much more advanced in drilling. The perfection of prospecting methods, instruments, and apparatuses in geophysics and in drilling will lead to a streamlining of research and, by the same token, to a reduction in costs.

The All-Union Scientific-Research Institute of Geological Prospecting in Leningrad (VNIGRI)

VNIGRI is the principal scientific organ of the Petroleum Industry Department in the field of prospecting for deposits of petroleum and gas. One of the greatest achievements of the Institute in the past two decades is a fundamental change of the distribution of petroleum deposits in the Soviet Union.

As a result of systematic research, large new deposits of petroleum were found. Petroleum prospecting is quickly advancing from traditional regions to new ones; these already include 75% of the toal resources.

These results were obtained through a change in work methods. In the past, geologists were interested only in the shallow layers of petroleum on the basis of photographhs taken with a very detailed stratigraphy. Gradually, surface and shallow drillings were made, and finally geophysical

measurements were introduced into prospecting. In the development of further research, the concept of resistivity drillings arose; it gave the greatest yield of core as a basis for many-sided, detailed research.

The Institue paid a great deal of attention in its projects to geochemical research to determine the character of the levels holding petroleum. Extensive geochemical research is being carried out on the Ural-Nadvolzanskiy deposits, in the Northern Caucasus, and in Azerbayzhan. Greatest attention was given to the designation of the chemical composition of concentrations enclosing organic particles, to the chemism of waters accompanying petroleum bearing deposits, and also to the surrounding bitumic rocks. This research was carried out in order to clarify the time of the formation of the petroleum, and gave very interesting results from both general and prospecting points of view.

The new research of petroleum geologists drew a great deal of attention to micropaleontological research; this gave good results, and in mahy regions new light was thrown upon the stratigraphy of the formations studied. These bases found application not only in the study of the profiles of petroleum drillings, but also in the stratigraphy of sediments of large regions. Extensive paleontological and regional monographs were published characterizing formations from the Paleozoic to the late Tertiary.

Biostratigraphic, lithological, and mineralogical research require a comparatively large amount of material; namely, numerous drillings. This research requires considerable effort from the specialists and, most of all, it requires the establishment of new, faster methods of profile correlation relying on the physical properties of the rocks. The greatest speed was obtained in research using the core sampling method. Core sampling became essential in petroleum and gas drillings, and the introduction of this method allowed geologists to solve a series of exploitation problems. Nevertheless, core sampling did not offer data to study the stratigraphy of large areas; when drilling the first openings in a given region, a maximum amount of core analysis was essential for faunistic and mineralogical studies.

Due to core sampling difficulties in calcareous and halite rocks and in openings containing pipes, the Institute's geologists applied the results of nuclear physics, working with gamma and neutron core sampling.

The lithological-frontal atlas of maps of the Russian Platform compiled in 1952 and 1953 by the geologists of the Institute and the Institute of Geochemistry imeni Viyernadskiyego of the Academy of Sciences, was made up of 30 maps on a scale of 1:3,000,000 in the first part, including problems of the Paleozoic; and of 14 maps on a scale of 1:5,000,000 representing problems of the Mexozpic. It is of great service to research and to the concepts of prospecting.

The Prognosis Map of Oil and Gas Content of the USSR developed on 32 sheets in 1951 on a scale of 1:2,500,000, was of importance to the development of prospecting for petroleum and gas deposits. At present, due to the rapid progress of research and to the affluence of new material, a new prognosis map of petroleum and gas-bearing areas has been drawn up on the same scale, with approximately 3,000 structures with deposit prospects outlined on it.

Independently of these projects, a series of other synthetic maps of the most important petroleum bearing areas of the Soviet Union has been published.

Drilling for numerous new deposits allowed the Institute's geologists to gain wide experience in prospecting techniques. It appears that petroleum deposits are also found in rocks of very slight porosity and in numerous fissures caused by cracking, which greatly increased exploitation effects.

The Institute's staff is somewhat different from the staff of the All-Union Institutes of the Department of Geology and Preservation of Mining Deposits; it has more technical personnel connected with the supervision of drilling and laboratory assistance. In 1957, the scientific and scientific-technical staff of the Institute consisted of 1,590 workers. This included 103 independent scientific workers; approximately 600 persons were assistant scientific workers, and approximately 600 were technical and laboratory workers; the administrative personnel made up 15% of the staff.

The tasks facing the institute are considerable, particularly in the large areas of Siberia where a few drillings resulted in eruptions of gas, and where geochemical prospecting indicates the existence of conditions conducive to the formation of petroleum deposits in sediments of the oldest to the most recent periods.

(The final part of this article dealing with the institutes of the Academy of Sciences will appear in one of the later issues).

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